REMARKS

Claims 2, 4-6, 9, 11-13, and 15-19 are now in the case.

Claims 1, 3, 7, 8, 10 and 14 have been cancelled.

Add Claims 17-19.

No Claims have been allowed.

The Amendments.

Applicant has amended independent Claim 15 to positively recite the protein concentration of the source material in step (a) and of the recovered precipitate in step (e). Support for these limitations is found on page 5, lines 14-17, and on page 7, lines 26-28. Holding step (b) of Claim 15 now positively recites a holding pressure of 400-800 psi as supported in step (a) of the claim. Step (d) has been inserted into Claim 15 to clarify protein precipitate is separated from the protein source solution/dispersion. Support for this limitation is found on page 7, lines 16-19. Newly added Claims 17-19 specify preferred starting concentrations of protein in the protein source, support is found on page 7, lines 14-17.

The Rejection under 35 U.S.C. §103(a).

Claims 2, 4-6, 8-9, 11-13 and 15-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dahlstrom *et al.* taken

with Tomasula '265. Withdrawal of this rejection is requested for the following reasons.

Applicant's remarks submitted in the previous response are incorporated herein. Applicant acknowledges that Dahlstrom contemplates treating soy milk and one of the acids contemplated by Dahlstrom is carbonic acid. However, the claimed invention differs from the process of Dahlstrom in several critical respects: (1) Applicant uses high pressure **carbon dioxide** rather than carbonic acid. (2) Applicant applies a **holding step** at a pressure in the range of 400-800 psi which Dahlstrom does not do. (3) Applicant employs a **gradual** depressurization in step (c) which Dahlstrom does not do. (4) Applicant **separates** a protein precipitate from the initial vegetable protein source, which Dahlstrom does not do. (5) Applicant **concentrates** the protein from an initial 80% by total weight solids to at least 85% by total weight solids. The process of Dahlstrom does not permit any of these conditions to occur.

As discussed in the previous response, Dahlstrom forces the protein and acid streams together through a restricted orifice under high pressure (as in a Sonalator®, see Examples) to create extreme turbulence and promote dispersing of the ingredients (col.4, lines 13-20). The role of the acid is to reduce the pH

of the protein below the isoelectric point, and thereby precipitate a curd. Even though a portion of the carbon dioxide in Applicant's process becomes carbonic acid under the pressures applied in step (a), the gaseous carbon dioxide is **required** to create and control the pressurization and pH reduction. Carbonic acid cannot be used to create and sustain the required pressures of 400 psi to 800 psi. The Examiner urges that it would be obvious to substitute the carbon dioxide of Tomasula for the carbonic acid of Dahlstrom. However, as Applicant has previously pointed out, the substitution would render the Sonalator® of Dahlstrom inoperative because the rapid pressure drop at orifice 26 would cause the CO_2 to freeze, blocking the orifice.

The pressures obtained in the Sonalator®-type reactor of Dahlstrom are the result of pumps (e.g. 14 and 24, FIG. 1) and are created and released instantaneously (see col. 5, lines 2 and 3, and 9-14). Thus, Dahlstrom does not have the claimed holding step (particularly a holding step of at least 1 minute at 400-800 psi) as required by step (b). This holding step is important to Applicant's process for the development of large curd particles. Because the Dahlstrom process is designed for instantaneous pressurization and immediate coagulation, it would not be obvious to modify that process to include a holding step.

The gradual depressurization required in Applicant's step (c) is also critical to maintaining the particle size of the protein coagulum produced in holding step (b). In Dahlstrom, the aqueous protein precipitate exits orifice 26 as a high pressure jet stream (paragraph bridging cols. 3 and 4). The combination of rapid pressure drop and the impingement of the protein curd upon the edge of blade 30 will cause substantial disruption of the protein particles.

In Dalhstrom, everything that goes into the Sonolator® is ejected together. That is, there is no way to employ the Sonolator® in a controlled fashion to separate the curd from the dissolved or suspended material. By design, the apparatus and method of Dahlstom simply convert the acidulated source material into a homogenous mass having a consistency somewhere between that of mayonnaise and Cheez Whiz®, without provision to separate a discrete curd from the remaining material.

As a result of the separation step, Applicant is able to recover a precipitated product that is enriched in protein and having the consistency of cottage cheese. This is not a feature of the Dahlstrom process, wherein the recovered product would have the same protein concentration as the source material, or

perhaps an even lower concentration by virtue of dilution with the carbonic acid.

In summary, Applicant's claims require use of high pressure carbon dioxide, a holding step at a pressure in the range of 400-800 psi, a gradual depressurization, separation of a protein precipitate from the initial vegetable protein source, and concentration of the protein from an initial 80% by total weight solids to at least 85%. Not only are none of these limitations taught or suggested by Dahlstrom; but the Dahlstrom system is not amenable to modification to include these modifications for the reasons given above. Notwithstanding that Tomasula teaches precipitating protein from milk by lowering the pH with high pressure carbon dioxide, Dahlstrom cannot be modified by substituting the carbon dioxide of Tomasula as urged by the Examiner. The fact that Tomasula teaches a holding step and gradual depressurization is immaterial, if Dahlstrom cannot use high pressure carbon dioxide. That both Dahlstrom and Tomasula are concerned with obtaining protein concentrates is simply not enough to surmount the technical impossibility of using the apparatus of Dahlstrom in a manner for which it was not intended to be used.

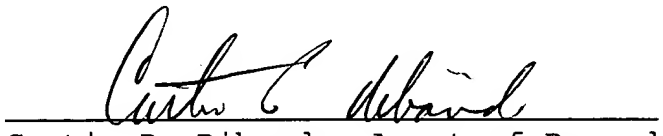
Summary.

Applicant's independent Claim 15 clearly recites at least five limitations which distinguish Applicant's invention from the teachings of Dahlstrom. Though some of these limitations are taught by Tomasula, the apparatus of Dahlstrom does not permit substitution.

Attached is a marked-up version of the changes made to the claims by the current amendment captioned **"Version With Markings To Show Changes Made"**.

Accordingly, Claims 2, 4-6, 9, 11-13, and 15-19 are deemed to be in condition for allowance and a favorable action on the merits of the case is earnestly solicited.

Respectfully submitted,



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Attachments
- Version With Markings To Show Changes Made - 4 pgs.

Version With Markings To Show Changes Made

IN THE CLAIMS

Amend Claim 15 as follows:

15. (Amended) A process for providing a concentrate of vegetable protein comprising:

a) applying carbon dioxide at a pressure of from about 400 to 800 pounds per square inch (psi) to an initial solution/dispersion of a vegetable protein source having a protein concentration of less than 80% by total weight of [and associated vegetable] solids, wherein said carbon dioxide forms carbonic acid (H_2CO_3) in the solution/dispersion and lowers the pH below about 5.5;

b) holding the pressurized solution/dispersion at a pressure of from about 400 to 800 psi for at least 1 minute in order to precipitate the vegetable protein;

c) gradually depressurizing the solution/dispersion in order to maintain particle size of the protein precipitate; [and]

d) separating said protein precipitate from said solution/dispersion; and

e) [removing] recovering a solid protein precipitate [which has a higher] having a concentration of protein greater than [the initial solution/dispersion] 85% by total weight of solids in said precipitate.

Rewrite Claim 2 as follows:

2. (Twice Amended) The process of Claim 15 wherein said initial [solution dispersion] solution/dispersion comprises a solution or dispersion of soy solids.

Rewrite Claim 4 as follows:

4. (Twice Amended) The process of Claim 15 wherein said vegetable protein [and associated vegetable solids] source is neutralized before [step a)] step (a).

Rewrite Claim 5 as follows:

5. (Twice Amended) The process of Claim 15 wherein the [concentration of protein in the] solid precipitate of [step g)] step (e) has a protein concentration of at least 90% by total weight of solids.

Rewrite Claim 6 as follows:

6. (Amended) The process of Claim 2 wherein the [concentration of protein in the] solid precipitate of [step g)] step (e) has a soy protein concentration of at least 90% by total weight of solids.

Cancel Claim 8.

Rewrite Claim 9 as follows:

9. (Amended) The process of Claim 2 wherein the pH [in step d)] is reduced to between 4.2 and 4.8.

Rewrite Claim 11 as follows:

11. (Amended) The process of Claim 2 wherein the holding [time in step e) is for between 10 and 60 minutes] in step (b) is for a time in the range of 10-60 minutes.

Rewrite Claim 12 as follows:

12. (Amended) The process of Claim 11 wherein the holding [time] in step (b) is at a temperature [between 30 and 75 degrees Centigrade and a pressure between 400 and 1200 psi] in the range of 30-75°C.

Rewrite Claim 13 as follows:

13. (Amended) The process of Claim 2 wherein the pH [in step d)] is reduced to between 4.2 and 5.0.

Add the following claims.

17. The process of Claim 15 wherein said vegetable protein source has a protein concentration of less than 70% by total weight of solids.

18. The process of Claim 15 wherein said vegetable protein source has a protein concentration of less than 60% by total weight of solids.

19. The process of Claim 15 wherein said vegetable protein source has a protein concentration of less than 40% by total weight of solids.